

## DMS - 4635

### METAKAOLIN

**EFFECTIVE DATE: AUGUST 2004**

**4635.1. Description.** This Specification establishes requirements and test methods for high-reactivity metakaolin. Metakaolin is a reactive aluminosilicate pozzolan formed by calcining purified kaolinate.

**4635.2. Units of Measurements.** The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

**4635.3. Bidders' and Suppliers' Requirements.** The metakaolin must be pre-qualified and in accordance with the requirements of this Specification before it is allowed on Department projects.

**4635.4. Pre-Qualification Procedure.**

- A. Pre-Qualification Request.** Submit a written request for evaluation under DMS-4635 to the Texas Department of Transportation, Construction Division, Materials and Pavements Section (CST/M&P), Cement Laboratory (CP51), 9500 North Lake Creek Parkway, Austin, Texas 78717.
- B. Pre-Qualification Sample.** Submit two grab samples of at least 1 kg in size, corresponding mill certificates, and Safety Data Sheets with the pre-qualification request. Submit materials for laboratory and field evaluations at no cost to the Department.
- C. Sampling and Testing.** Sampling will be in accordance with Tex-317-D. Testing will be in accordance with ASTM C 311.
- D. Evaluation.** CST/M&P will notify prospective bidders and suppliers after completion of material evaluation.
  - 1. Qualification.** The Department will accept materials meeting the requirements of this Specification for use on Department projects.

Report changes in the composition or in the manufacturing process of any material to CST/M&P. Significant changes reported by the manufacturer, as determined by the Director of CST/M&P, may require a re-evaluation of performance.
  - 2. Failure.** Producers not qualified under this Specification may not furnish materials for Department projects and must show evidence of correction of all deficiencies before reconsideration for qualification.

The Department normally bears the costs of sampling and testing; however, the supplier will bear the costs associated with materials failing to conform to the requirements of this Specification. The Director of CST/M&P will assess this cost at the time of testing.

Amounts due the Department will be deducted from monthly or final estimates on contracts or from partial or final payments on direct purchases by the State.

**E. Periodic Evaluation.** The Department will sample and test metakaolin during the course of a project to ensure continued specification compliance. Department representatives may sample material from the plant, terminal, transportation containers, and concrete plants.

**4635.5. Material Requirements.** Metakaolin must meet the requirements of ASTM C 618, Class N, with the modifications listed in Table 1.

**Table 1**  
**Modified Specification Requirements**

Item	Limit
Silicon dioxide (SiO <sub>2</sub> ) plus aluminum oxide (Al <sub>2</sub> O <sub>3</sub> ) plus iron oxide (Fe <sub>2</sub> O <sub>3</sub> ), minimum, %	85.0
Available alkalis, maximum, %	1.0
Loss on Ignition, maximum, %	3.0
Fineness: amount retained when wet-sieved on 45-μm sieve, maximum, %	1.0
Strength activity index, at 7 days, % of control	85
Increase of drying shrinkage of mortar bars at 28 days, maximum, %	0.03
Density variation in percentage points of density from the average of the last 10 samples (or fewer, provided 10 have not been tested) must not exceed ±	5